

ON HYDATIDS OF THE LUNG:

Their Diagnosis, Prognosis, and Treatment,

AND

OBSERVATIONS ON THEIR RELATIONS TO PULMONARY
CONSUMPTION, AND OTHER DISEASES
OF THE CHEST,

BY

S. DOUGAN BIRD, M.D., L.R.C.P., &c.,

LECTURER ON MATERIA MEDICA AND THERAPEUTICS IN THE UNIVERSITY
OF MELBOURNE; LATE HONORARY PHYSICIAN TO THE ALFRED
HOSPITAL, BENEVOLENT ASYLUM, AND IMMIGRANTS'
AID SOCIETY; AND FORMERLY PRESIDENT OF
THE MEDICAL SOCIETY OF VICTORIA.

"Unbidden Guests."—SHAKESPEARE.

SECOND EDITION.

GEORGE ROBERTSON,
MELBOURNE, SYDNEY AND ADELAIDE.

1877.

MELBOURNE:
M'CARRON, BIRD AND CO., PRINTERS,
37 FLINDERS LANE WEST.

PREFACE TO THE SECOND EDITION.

THIS Work is the result of the experience of sixteen years of practice in this colony, and is a *resumé* of two papers which were read before the Medical Society of Victoria, and published in *The Australian Medical Journal* in March, 1871, and October, 1873, together with additional cases and further observations on the results of treatment. The author may lay claim to originality thus far, that specific rules for the Physical Diagnosis of the unbroken Hydatid Cyst within the chest wall and its immediate and successful surgical treatment are not to be found elsewhere. A Second Edition has been found to be necessary, as the greater part of the First was unaccountably lost on its journey to Europe, whence inquiries are frequently being made for it. An extended experience has also added to the interest of the subject, and the cases now recorded of the radical cure of old suppurating

intra-thoracic Hydatid Cysts, by their entire removal through an incision between the ribs, will be both novel and curious to the European practitioner.

To a work entitled "Kystes Hydatiques du Poumon et de la Plèvre, Etude Clinique, par Alfred Williams Hearn," which appeared in Paris in 1875, the author is indebted for many complimentary references by name to his labours on this subject, as well as to those of other Victorian observers.

As the views on diagnosis and treatment herein enunciated are the outcome of personal observation, on ground where probably no previous investigator has enjoyed equal opportunities, they will doubtless have the weight which they deserve, and no more, in the estimation of the Profession both in Europe and in these colonies. References to European observers are made only to note coincidence with, or difference from, our vastly wider experience, the Author's object being to present original matter, and this in as condensed a form as is compatible with accurate illustration.

MELBOURNE, *June*, 1877.

ON HYDATIDS OF THE LUNG.

THE subject of hydatid cysts in the lungs is one of great interest to Australian practitioners, both from the frequency with which the disease is met with, especially in Victoria, and also from the fact that its successful treatment is still to some a problem or a subject of dispute, while its diagnosis often requires from all both skill, acumen, and experience. Indeed it is upon personal observation alone that we can rely for the recognition and cure of this parasite, as it is probable that any medical man in considerable practice in Victoria has had the opportunity of seeing many score of times more cases than any of the leading authorities on chest diseases in Europe.

The question of the origination of hydatid in the human body, though a question of vast interest, cannot be more than glanced at here. The researches of Cobbold, Kuchenmeister, and others, show that the ova of the *Tœnia Echinococcus*, a parasite which infests the bowels of the dog, will, if introduced into the human body and that of some other animals, develop into what we know as the hydatid cyst.

It remains for some colonial observer, with ample leisure, as well as zeal and skill, to demonstrate with certainty the causes of the unusual frequency of the disease in this colony. Dr. MacGillivray, in a paper in the *Australian Medical Journal* for March, 1867, gives an interesting account of the special facilities afforded by mining and pastoral life for the contracting of hydatid disease; but the question naturally arises, how is it that in point of fact the inhabitants of our metropolis, rich or poor, suffer from it just as frequently as the shepherds of the western plains, or the miners of Ballarat and Sandhurst? There can be no doubt that the ova have an extraordinary tenacity of life, and it is more than probable that unfiltered Yan Yean water is a common vehicle for them. To go a step further, it is well known that desiccation, below a certain temperature, will not destroy the vitality of many forms and grades of insect life. The dust of our streets is the result of mud, from the frequent use of the Yan Yean hydrant, dried by the hot wind and powdered by the constant traffic of the day. It is notorious that this fine dust does during respiration enter the air passages more particularly of women, who are less protected about the mouth and nose by hair than men. Nothing is more likely than that the dried-up ovum, revived by the moisture and steady warmth of the body, should now commence its new career. Any one who has witnessed the drafting of sheep or cattle on a hot day will readily understand how

well this dust theory applies also for the explanation of the origination of pulmonary hydatid in those engaged in pastoral pursuits, the readily dried and pulverized droppings of the sheep-dogs furnishing the *materies morbi* ready made on the spot. If this hypothesis be correct, it will account to a great extent for the remarkable frequency of lung hydatids here relatively to those in the liver or elsewhere.

It is well known that the sheep is obnoxious to the echinococcus as well as its more familiar parasite the fluke ; but whether either is communicable to the human subject by the eating of partially cooked mutton, as is the popular belief, we have no positive data at present to determine. The eating of half-washed water-cress, and such like plants growing in creeks and water-holes readily accessible to dogs, affords one common explanation of the entrance of the larva into the digestive canal, nor is the warning of Mr. Sydney Gibbons in the *Argus* not long since, of the folly of allowing children to be licked and caressed by dogs, undeserving of attention.

A very intelligent gentleman, who has lived many years in the Western district, tells me that in his opinion the dingo or native dog never had *tœnia* till the introduction of the European dog, since which echinococcus has become common. The aborigines have now hydatid very frequently, but before our advent it appears to have been unknown. It is a curious fact that the opossum, which is one of the

few indigenous animals which feeds on the Eucalyptus leaves, is always free from intestinal worms, and is very fat. The kangaroo, on the other hand, which feeds on grass, has no fat, and swarms with worms, both in the intestines and also in the muscles and joints.

The whole subject of the etiology of hydatid is one of great interest and importance, and offers a fine field for original research, for which the above remarks are thrown out as suggestions.

The object of this work is to consider specially the means at our disposal for recognising with exactness the existence and locality of hydatid cysts within the chest wall, especially while the parasite is still in its integral state, and the sputa afford no assistance in the diagnosis from other morbid conditions presenting physical signs somewhat similar. Next, the curative treatment of such cysts, whether before or after their rupture and partial evacuation into the bronchial tubes, by operative measures, and medicines given by the mouth or otherwise; lastly, the prognosis or probable future of persons so affected, and relations with other diseases, more especially with pulmonary tubercle.

DIAGNOSIS.—There can be no doubt that the only absolute evidence of the existence of hydatid in the lung, whether originating there, or in process of passage from the liver, is by the appearance in the sputa of the characteristic cysts or portions of them, or fragments of the hooklets of echinococci; but this

does not happen till what we may call the second stage of the disease, when the entozoon has begun to die and be expelled from the body. Such an occurrence is, of course, positively distinctive, and settles the case at once, without any difficulty or trouble beyond the use of a quarter or even half inch lens. But a personal microscopic examination should always be made. Patients have often described their sputa to me as containing "things exactly like the skins of grapes," which on examination proved to be only flakes of tough and hardened mucus. But when the cyst is still entire, and no definite information can be got from the examination of the sputa, we must fall back upon a systematic physical examination of the chest, by which, aided in some cases, but not all, by the general symptoms, a positive diagnosis may be formed; a successive exclusion of morbid states within the thorax other than hydatid, which may give rise to a group of signs more or less resembling it, being the safest and most scientific method of procedure. When doubt still exists, an exploratory puncture is not only allowable, but may be looked upon as necessary (for reasons which will be given *in extenso* farther on), such an operation not only setting the diagnosis beyond doubt, but being the first step in curative treatment. In this colony we have become so familiar with the existence of hydatid cysts in the viscera, discovered during life or found unexpectedly *post mortem*, that we are always justified in concluding that an otherwise

unexplained internal tumour, especially if it be painless, is in all probability a hydatid.

We must now consider the systematic diagnosis of the unbroken hydatid cyst within the chest wall, and probably imbedded in the lung substance. First we will note the *General symptoms*.

When the cyst is still of moderate size, and therefore does not interfere much with the surrounding structures, it *may* cause little or no disturbance—in fact, may remain unnoticed by the patient for a considerable period, particularly if, as often happens, he has a capacious well-developed chest, and lives an active open-air life. I have frequently seen cases where a portion of the lung, amounting to certainly not less than one-fourth or even one-third of its bulk, was nullified for breathing purposes by the size and pressure of a hydatid cyst, though the patient complained but little of shortness of breath. The accommodating power of healthy lung tissue to increased work is indeed most wonderful when there is no constitutional mischief at work, as in these cases when uncomplicated. But as the cyst enlarges, which it inevitably does if not interfered with, a train of general symptoms in most cases ensues which are the result of *pressure*, or *irritation*, or both of these. *Dyspnœa and duskiness of the skin* may be observed more or less marked according to the size, locality, and rapidity of increase of the tumour, and the capacity and mobility of the individual thorax. In women, if the cyst occurs in the

upper lobes, these last symptoms are usually very prominent. The presence or absence of *pain* and its character, acute or otherwise, are determined by the same conditions.

A more or less phthisical-looking cachexia, even when the case is not complicated with tubercle, is often noticed, with *progressive loss of flesh*; and in several instances I have seen *well-developed clubbing of the finger-ends and incurvation of the nails** which gradually disappeared with the other symptoms after the hydatid had been tapped or expectorated, and the cure was complete. *Cough* nearly always occurs, and varies in character in the early stages, but when the cyst is large is usually of a violent and paroxysmal character, especially when the disease is situated near the base of the lung. The *expectoration* at first is simple mucus, which may or may not be stained with blood; as the case progresses it becomes more or less purulent. Profuse hæmoptysis is seldom or never noticed, but I have seen several ounces at a time in an aggravated case when tapping had been long delayed; it sometimes ceases altogether after operation or spontaneous rupture, being the result of pressure on the pulmonary veins, though in the latter case a good deal of blood may be spit at the time of rupture, and the subsequent purulent sputa and portions of cyst are mixed with or stained with

* These symptoms were very well marked in the case of a lady whom I attended eight years ago with the late Dr. Tracy, and who eventually spat up the whole cyst and is now in perfect health. The physical signs of cavity, gurgling, cavernous breathing, and pectoriloquy were also very prominent.

it. Should the last group of symptoms—dyspnœa, deficient aeration, wasting, clubbed fingers, cough, and expectoration—remain persistently after the death and expulsion of the hydatid, the probability is that the case is complicated with tubercle, either coincident with the origination of the cyst, or called from latency into activity and localised by its pressure on the lung substance and pulmonary vessels and air tubes, and the consequent deficient oxygenation of the blood. This part of the subject will be considered more fully hereafter. *Visible venous engorgement* from pressure is in my experience rare, and often forms the distinguishing characteristic of intra-thoracic cancer from hydatid.

Such, then, are the general symptoms observable in cases of unbroken hydatid cysts within the lung, and no doubt they mimic with tolerable exactitude those of ordinary cases of phthisis, and it is not till we come to strip our patient, and observe the *physical signs* by auscultation and percussion, that we can form a reliable diagnosis. To give the reader an idea of how little has been hitherto done in this field, it is only necessary to quote a few of the best and most recent British authorities on diseases of the lungs. Dr. Walshe (fourth edition, 1871) says more on the subject than any other writer :—

“ There may be a total deficiency of subjective symptoms, the disease in fact being latent, provided the cyst be of moderate size, and have not irritated the adjacent tissues. But the rule is that symptoms essentially phthisical in character occur—cough,

dyspnœa, more or less severe chest pain, and inability to lie on one side; expectoration, catarrhal or bloody, followed by that of fragments of their walls, or of perfect acephalocysts of various sizes, *giving at length the special character to the disease.* . . . So long as the sac remains unbroken, the physical signs simply indicate solidification. . . . The diagnosis from tubercular phthisis will in many cases probably prove impossible unless acephalocysts or echinococci, in fragments or whole, be discoverable in the sputa."

So that, in point of fact, Dr. Walshe, who has evidently had more experience of this disease than any British authority, gives no means of distinguishing solidification of the lung from unbroken hydatid cyst, and practically rules that the sputa are the only signs which give a special character to the disease.

Fuller says nothing on the subject of diagnosis before the self-evident expectoration takes place, nor does Watson. Aitken nearly ignores the disease altogether. Tanner (sixth edition, 1869) only says, under the head of intra-thoracic tumours, "Primary hydatid disease of the lung or of the mediastinal structures is hardly ever met with. In cases where hydatids or portions of their cystic membranes are expectorated, the original seat of the parasitic growth has been the liver—at least, this has been the case with the great majority of instances."

Dr. Hjaltalin, in the report on Iceland, where hydatid is endemic, in Dobell's "Progress of Medicine" for 1870, says these cysts are "most common in the liver and the lungs," but does not even hint at diagnosis in the latter case.

French observers appear to have had a considerably wider experience than this. Amongst the earlier writers we find that Laennec, though apparently never a personal observer of pulmonary hydatid, records a case under the care of M. Geoffray, and observes "that it must appear evident that by means of the stethoscope the progress of the disease might have been easily followed, and perhaps even a diagnosis sufficiently precise might have been attained to justify the puncture of the chest." Andral found a cyst in a patient's lung, *post mortem*, where "exaggerated respiration inexplicable during life" had existed. Amongst more modern French authorities to whom my attention has been recently called since the first appearance of this work, are M. Davaine,* who, however, gives but few examples of the disease. Andral records five; "Bricheteau, who specially devoted his attention to diseases of the chest, only saw two cases during a medical practice of more than forty years." Monneret only saw one case, which was detected *post mortem*. Trousseau in his clinical lectures, published by the New Sydenham Society, devotes some papers to the subject, and discusses it with his usual lucidity and power, but allows that he has only seen two cases during life. He speaks of the diagnosis as exceedingly difficult and embarrassing; the difficulty lying

* The accuracy and exactitude shown by these writers (whose works I only know through quotations in Dr. Hearn's compilation), as far as their limited sphere of observation permitted, cannot but excite our admiration of their industry and clinical sagacity.

in the fact that "there is no special sign of hydatids of the lung." Dr. Hearn quotes several other modern French physicians who have recorded cases, but the individual experience of each appears to have been so limited, that their collective conclusions, made from different points of view, are thus very deficient in practical value.

What, then, are the physical signs from which we may infer with any degree of certainty the existence of a still unbroken hydatid cyst within the thoracic cavity? They must vary very much according to the *size* and *locality* of the sac. And first, it will here be convenient to consider the relative frequency with which hydatids occur in different parts of the thorax. Australian experience shows that they are found in this part of the body next in frequency to the liver. My own experience of thoracic hydatid in the living subject comprises over one hundred and fifty cases; of these, one was in the mediastinum, one in the cavity of the pleura, two in that of the pericardium, and the rest were embedded in the lung substance. As Dr. Walshe observes, they "exhibit a preference for the bases of the lungs, and when originating near the root and enlarging without rupture, generally approach the chest wall in the lateral region; but they may be found in any part of one lung, or in both—there may be a single cyst, or more than one in different stages of development." The fact of a hydatid existing in the upper lobe or apex of a lung will of course favour the resemblance of

the symptoms to those of phthisis—in the lower lobe, to pleuritic effusion or some solid tumour. They exhibit no very decided preference for one or other lung, but are, I think, rather more common on the right side. The *size* of the sac is limited only by the capacity of the chest, the compressibility of the lung and absence of pleuritic adhesions, and the amount of disturbance to which the entozoon has been subjected by cough, external shocks as from falls, &c., and by operative interference and internal remedies. I have tapped cysts holding three or four pints of fluid, by which the lung has been compressed almost to the same extent as occurs in cases of empyema. But these are rare in Victoria, as the nature of the disease is generally recognised and treatment employed at an earlier stage. From eight to sixteen ounces of fluid is about the average capacity when they should be diagnosed with certainty and operated upon.

Furthermore, the nature and density of the cyst, and its influence on the lung tissue in which it is embedded, are most important pathological points in guiding us to a diagnosis. Dr. Walshe observes:—

“The natural history of the echinococcus, of the acephalocysts it inhabits, and of the mother cyst, is essentially the same in this organ as in their greatly more common seat, the liver. There is this difference, however, that the mother acephalocyst sometimes lies in direct contact with the lung texture, and, unlike that of the liver, is rarely surrounded with a thick shell or cyst-like wall of pseudo areolar tissue. The sac rarely attains great size. . . . Acephalocysts may be found in the midst of perfectly healthy tissue; this is very rare.”

My own experience accords rather with the earlier portion of this extract, namely, that the development of the cyst is much the same as in the liver, modified only by the greater elasticity and extensibility of the lung tissue. I have seen old lung cysts with as thick a shell as any in the liver.* All depends on age and non-interference. Young subjects doubtless are tender and fragile, and the external investing cyst is adventitious, and the result of sub-inflammatory exudation from the lung tissue in immediate contact with it. I have seen small cysts, not larger than a walnut or small apple, in the dead body, in immediate contact with the lung tissue; but beyond this size the investing shell usually commences to form.

The condition of the lung tissue surrounding the cyst is a most important subject in aiding us to diagnosis. So far from the undisturbed cyst being rarely embedded in perfectly healthy lung tissue, my experience is that it frequently is so; and this explains the wonderful success of operations on the lung, which do not require to be repeated nearly so often

* The densest and toughest cyst walls I have seen were in the cavity of the abdomen, not connected with the solid viscera. If connected with the mesentery or omentum they are nearly always fatal, the death of the parasite causing peritonitis and gangrene. Rupture of a cyst in the liver through the diaphragm into a bronchus is seldom seen here, as it is generally detected and tapped before attaining any size. Coincident pulmonary and hepatic cysts are not common, but I was recently consulted in the case of a young lady in whom the disease existed, in an advanced stage, in the right lung, the liver, and the abdominal cavity. A fatal result followed. I once saw a large abdominal hydatid operated on for ovarian tumour. It was closely adherent to the spine and main vessels, and its wall was as thick and tough as boot sole leather. Three ecraseurs were bent or broken in trying to separate it. It was stuffed

as in the liver. The small amount of irritation caused by a slowly enlarging cyst in the lung, and the very trifling modification in the breath sounds in the immediate neighbourhood which may be caused by it are, as we shall see presently, most important negative signs in the diagnostics of hydatid. I have very often in the dead-house found cysts, holding from one to three ounces of fluid, in perfectly healthy lung tissue. In such the mother acephalocyst was delicate and fragile, and had as yet no investing sac. Large old cysts, which have generally undergone spontaneous rupture, often have a dense leathery sac, and the surrounding lung tissue is more or less in a state of chronic hepatization; but these we are not at present considering. I have fortunately never had the opportunity of examining the lung of a patient after an operation on the hitherto untouched cyst, as all the cases I have seen have recovered, whether in the practice of others or my own; but the complete restoration of the normal breath sound in the locality of the tumour, after a shorter or longer period, negatives the possibility of any change in the lung tissue further than that temporarily caused by mechanical pressure.

full of daughter cysts with walls as tough as parchment, which, when turned out, bounded about the floor like indiarubber balls. The case promised well for a time, but she died of exhaustion on the eighth day, the weather being intensely hot. Last year I tapped a hydatid cyst which had existed several years, and which had been diagnosed by several first-class authorities in London and Edinburgh as abscess of the right kidney. The cyst wall was very dense, and I distinctly felt the grating caused by calcareous degeneration, as the trocar passed through it. A rapid recovery followed, with no other treatment.

The conditions then, which we have in these cases to bring about signs recognisable by the usual methods of physical diagnosis, are these, supposing the case to be uncomplicated and the cyst of moderate size—in fact, an average case suitable for immediate tapping; *a cyst, embedded in healthy lung tissue, more or less globular in form, containing fluid, slowly enlarging towards the periphery of the chest as affording the least resistance.* Dr. Walshe says, “So long as a sac remains unbroken, the physical signs simply indicate solidification; the quantity of respiration sound will vary with the existence or absence of pressure on an important bronchus.” Now, with all deference to the opinion of so high an authority, I must assert that this is in no way borne out by my own observation. When the cyst is still small, and it consequently exerts little or no pressure on any important bronchus or bloodvessel, the signs are indeed simply *nil*. But as it enlarges, the pressure always being centrifugal, only a layer of lung mechanically squeezed and emptied of blood and air, and the two layers of pleura intervene between it and the chest wall. The result of this in physical signs is, therefore, a nullity of respiration sound, no air whatever entering the compressed lung, though beyond the clearly defined margin of the cyst the breath sounds are at once normal. The signs of consolidation are absent, while the negative and positive signs of fluid are prominent even to fluctuation, which may sometimes be palpably detected in thin persons long

before any bulging of the intercostal spaces takes place, especially if the tension of the cyst is not excessive.*

The compressibility of a layer of lung tissue by the gradual enlargement of a cyst of this kind is very remarkable, and the practical results of such pressure on its future, if too long continued, most important. It is very rare to find any interval between an absence of physical signs and the actual (to all intents and purposes, as explained above) impingement of the sac on the chest wall. It is quite possible, however, that the reason of this may be, that patients often do not apply till this last state of things comes about. Of course, as Dr. Walshe describes, if breakage occurs into a bronchus, a set of symptoms and physical signs ensues of a totally different character.

The following, then, are the physical signs observable in a case of hydatid cyst of the lung which has progressed to the capacity of a pint or more of fluid, without interference from within or without:—*Expansion more or less deficient on the affected side; mensuration but little affected; absolute dulness on percussion, with absence of respiratory sounds over*

* Trousseau lays great stress upon "peculiar arching of the thorax" (Vossure), which, he says, is a "diagnostic sign full of meaning, and in itself sufficient to justify an exploratory puncture." This occurs sometimes, but by no means always, in advanced cases where no interference has occurred, and the sac has attained large dimensions, but is obviously not present in the earlier stages, though in these latter, as we shall see, the diagnosis may be reduced almost to a certainty, and puncture, as a curative means, may be employed with complete safety.

a space of the chest-wall not smaller than the palm of the hand, generally in the lateral or infra-clavicular regions, with absence of vocal fremitus in most cases. This dull space always presents a rounded outline—is limited by a line of demarcation so exact that it can be mapped out with pen and ink, and is unaltered by position. Beyond the boundary line percussion is clear and normal. The respiratory sounds, though inaudible over the dull surface, commence immediately beyond the pen line, and though probably rather harsh and puerile in character, are indicative of healthy lung tissue. Besides this, the distinctive vibratile thrill of fluid may sometimes, but not always, be detected by percussion over the intercostal spaces—a perfect exemplification of “peripheric fluctuation.” The percussion and respiratory sounds over the rest of the lung are probably not much altered. A localised pleuritic effusion, confined by adhesions, would fulfil the above physical signs; but such a state of things is very rare, and would probably be preceded by a history of pain and febrile symptoms. In fact, one is reduced to the conclusion that there is a sac containing fluid within the chest wall, slowly enlarging, causing little or no pain or local irritation, not the result of any inflammatory effusion, but foreign to, though growing in, the thoracic viscera. A hydatid cyst alone combines all these characters, so that the diagnosis may be reduced almost to a certainty.

The reader must bear in mind that all this refers

only to a cyst of *moderate size*. Should the disease progress without interference until the pressure on the surrounding tissues is more than they can bear, or if the enlargement takes place much more rapidly than usual, very serious effects are produced, which greatly complicate the diagnosis. Patches of pneumonia, with rusty or bloody sputa, sometimes even gangrene, obstinate bronchitic symptoms limited to the affected side, occasionally effusion into the pleura, or perforation of that membrane or even the diaphragm, as related by Laennec. But such are rare in this colony, as the disease is almost always recognised at an earlier stage. When a cyst has attained a large size without relief, and degeneration of its wall ensues, with rupture into a bronchus, the symptoms become distressing indeed, though the diagnosis is unmistakable. Intense prostration, hectic, the ceaseless expectoration of blood, pus, and half putrid acephalocysts of excessive fœtor, and often portions of gangrenous lung tissue, go on sometimes for months, till the patient in most cases sinks from exhaustion, unless relieved by the evacuation of the sac and its contents by a free incision between the ribs, as presently described. The physical signs in such a case are those of pulmonary abscess, or large tubercular vomica, which need not be enumerated.

I have recently had under my care, in the Alfred Hospital, a case in which the ruptured cyst and the still untouched and growing animal co-existed in the same lung, presenting in each case the characteristic

physical signs in a very instructive and probably unique manner. The patient was a woman thirty-six years of age, in previous good health, and who had lived in one of the immediate suburbs of Melbourne for many years. In the lower lobe of the left lung the outline of a cyst of moderate size could be mapped out very accurately, as described above. It was nearly circular, the diameter being about four and a-half inches, the locality the infra-axillary region. Clear percussion and respiratory sounds were audible all round the line of demarcation as usual. In the upper scapular region, and for about three fingers' breadth below the spine of the scapula, were the gurgling and cavernous sounds of cavity, and the patient was expectorating the characteristic hydatid sputa. This cyst appeared to have been ruptured by an effort of coughing some few days before admission, and, as the symptoms were not urgent and the patient was advanced in pregnancy, the usual internal remedies only were given, any operative interference being postponed till after her confinement. Both these cysts were comparatively small in size, and the patient's general health was not much affected. The distinction between cases of hydatid expectoration from cysts in the lung, from those where a liver hydatid bursts into the lung, is generally easy, from the previous hepatic symptoms and the staining of the sputa with bile.

The diseases most likely to be mistaken for hydatid of the lung, or pleura, are :—

(1). *An unbroken cyst in the liver high up and far back on its convex surface may not be distinguishable from one in the base of the lung immediately over the liver, or one in the cavity of the pleura.* I treated such a case in the Alfred Hospital, in May, 1871. The tumour was diagnosed as hepatic, and I introduced the trocar under the cartilages of the right ribs, in an upward and backward direction. More than four pints of the usual clear fluid escaped. The operation had to be repeated, and the patient died suddenly of hydatid of the heart. The liver was found to be small and healthy, and had not been wounded by the trocar. The acephalocyst had occupied the cavity of the pleura.*

In a patient from whose liver I removed a short time since by incision a very large cyst, which had been previously twice tapped, the converse error occurred. The outline of dulness reached as high as the fifth rib, and the incision was made between the sixth and seventh. The copious flow of bile which followed the extrusion of the cyst proved its hepatic site, and a rapid recovery has ensued.

* See *Medical Times and Gazette*, August 9th, 1873. The condition of the heart, as described by Professor Halford, is interesting, and worthy of republication:—"Hydatid cysts occupy the whole of the outer surface of the heart, extending from the upper surface of the auricles, surrounding the large vessels, where some of them are of the size of small oranges. They seem to me to have arisen in the visceral layer of the pericardium, not encroaching much into the muscular substance. The cavities of the heart are untouched by the parasites. The visceral layer of the pericardium is much thickened, and studded with little cysts. It may be said that the echinococci occupied the cavity of the pericardium."

Some roughness of breathing was heard in the base of the lung posteriorly with faint subcrepitant râles; cough more or less troublesome, with a very few loose hooklets of echinococci in rather copious muco-purulent sputa, which never have contained bile. The cough is not much changed since the removal of the hepatic cyst, though breathing is readily audible all over the lung, which has now resumed its position, the liver having rapidly contracted to its normal size. I believe the hydatid sputa to be primarily pulmonary and unconnected with the liver cyst.*

The differential diagnosis of cysts in the lung and pleura is unimportant, as the treatment is the same. As recovery in most cases follows the operation of tapping, the problem remains unsolved, unless extirpation is resorted to. It is probable that M. Davaine is correct in his statement that cysts originating in the pleura have no adventitious wall.

(2). *Phthisis*. Dr. Walshe observes that the diagnosis from phthisis is in many cases impossible, unless the sputa are characteristic of hydatid. Such

* In the case of a young lady from whose liver I extirpated a large old suppurating cyst (which had been several times tapped) in the winter of 1875, a curious phenomenon followed. For several weeks there flowed from the drainage tube which was left in the liver many ounces daily, sometimes as many as sixteen or seventeen, of clear biliary fluid, quite unmingled with either mucus, pus, or blood. No bile apparently entered the intestines, for the stools were pure white. In the meantime the patient gained weight and strength, and had not, though of remarkably bilious temperament, any tinge of jaundice. As time went on the flow of bile diminished and re-entered the intestines, and the gradually shortened tube was removed. The young lady is now the most robust of a large family, as she has before been the most delicate.

would be the case when the cyst is only of moderate size, and does not impinge on the chest wall so as to give the physical signs of fluid; while at the same time general symptoms, common to phthisis and other wasting diseases, may be going on. But great care must be taken not to pronounce too authoritatively as to the diagnosis of one or the other disease, for they very commonly coexist, the tubercular deposit being a sequence of long continued pressure on the lung—for obstructed circulation, whether of air or blood, of course favours both the origination and deposit of tubercle in persons predisposed to that class of disease. I have in many instances seen the characteristic phthisical aspect, clubbed fingers and incurved nails, and genuine tubercular crackle, gradually supervene on a case of simple hydatid, and the latter disease appear to retire into the background, while the patient ran through the usual course of consumption. And here I must insist on the necessity for the early diagnosis and treatment of hydatid in the lung, in persons predisposed to tubercle, before the cyst shall have time to grow large, and, by its pressure on the lung tissue, bring about that chronic engorgement which is most likely to offer a *locus standi* to constitutional tendencies which are only waiting, so to speak, for such an opportunity. I will here instance two cases illustrative of this. A young lady of highly nervous temperament, and exactly the subject for active tuberculous degeneration, to which she had also an hereditary title, was brought to me about

eighteen months ago with an unmistakable hydatid cyst in the upper lobe of the left lung. It was indolent, but slowly enlarging; painless, like most hydatids, and causing but few symptoms. I urgently pressed on the parents the necessity of at once tapping the cyst—not that it then threatened life in any way, but that the constant and gradually increasing pressure on the lung tissue must eventually cause local mischief, and wake up the patient's latent constitutional tendencies. The advice was wisely taken, the cyst was tapped, the usual internal remedies given, and the lady is now fat and well. A similar case in a young man, twenty-two years of age, in which the patient declined operation, gradually developed phthisis, which I am convinced might have been averted had tapping been resorted to in time. The fact that the stasis of the blood in the pulmonary capillaries and minute veins, which is the necessary result of continuous pressure, must favour the deposit of any morbid element which may be hatching in the constitution, will hardly be denied; and our constantly recurring experience of the harmlessness of tapping these cysts often renders such a proceeding an imperative necessity to the practitioner as a prophylactic.

(3). *Localised pleuritic effusion*, probably purulent, an uncommon condition, but occasionally met with, will give physical signs identical with those of a large hydatid cyst impinging on or originating near the chest wall. I recently saw two cases with Mr. Hewlett, which turned out to be pleuritic on tap-

ping, though the physical signs exactly corresponded with those described as characteristic of hydatid. Curiously enough, both were children of about the same age, living near each other; and in both the respiratory murmur and percussion sounds were normal below and above the level of the dulness, which corresponded to about the area of the palm of the hand between the axillary folds. There was no distinct history of pleuritic inflammation, but the fluid, which was sero-purulent, showed none of the microscopic signs of hydatid.

(4). *Circumscribed abscess of the lung* may present most of the general features of hydatid; but the condition of the neighbouring lung tissue, and the previous general symptoms, will usually render the distinction easy.*

(5). *Mediastinal tumour or abscess* may be very difficult to distinguish from hydatid. I have seen a cyst in the anterior mediastinum present symptoms so similar to chronic pericardial effusion as to be mistaken for it by several competent observers.

(6.) *A solid tumour of the lung*, generally malignant, may possibly somewhat mimic the physical signs of hydatid; but the previous history and venous engorgement which usually accompany such

* By the way, localised suppuration, or, in other words, pulmonary abscess as a result of pneumonia, is by no means uncommon in this climate. If the symptoms are urgent, there is generally adhesion to the chest wall, and I have frequently treated such cases successfully with the large trocar and drainage tube like an ordinary abscess.

cases must be looked to. In any doubtful case, a puncture with the fine trocar can do no harm.

It must not be forgotten that we may and constantly do meet with cases of scattered hydatid deposit in the lung with no cyst large enough to betray its presence unmistakably by the physical diagnosis described; or indeed parasitic organisms other than those derived from the *tœnia echinococcus*, as described by Mr. Ralph. (See appendix.) Here a microscopic examination of the sputa is our only true guide, as the stethoscope tells of nothing but more or less bronchial irritation, and patches of pneumonia. Of course no operation is practicable, but medical treatment, particularly turpentine, is appropriate. Such cases nearly always eventually do well, though the cure sometimes occupies weeks or even months.

Treatment.—This naturally resolves itself into *operative* and *medicinal*. And here, again, we must more than ever rely on our colonial experience, for European authorities hardly do more than hint at any remedial measure in lung hydatid. For example, Dr. Walshe: "Of the specific treatment of pulmonary acephalocysts, or of those otherwise localised, little is known. Chloride of sodium and iodide of potassium, presumedly deleterious to echinococcal life, should be tried. . . . Should an external swelling appear, it seems advisable to open it. Mr. Freteau (*Ann. de Montpellier*, t. xi), sixty years ago, opened a sac in the right dorsal region. Upwards

of 400 fragments of hydatids were discharged by the wound, and fifty expectorated. The patient, a male, recovered." Dr. Fuller says that, "If left alone, half the cases will probably survive. . . . Treatment is of little avail in cases of intra-thoracic hydatid. We know of no means of destroying the acephalocyst, or ensuring its expulsion." Dr. Tanner does not mention treatment at all, in his short notice of this affection under the head of intra-thoracic tumours; nor do the Icelandic writers. All other British writers on diseases of the lungs, if they touch the subject at all, state that treatment is not of any avail.

Laennec, as we have seen, over forty years ago, suggested the possibility of puncture in these cases. Trousseau, after recording a case where an exploratory puncture was made, and afterwards a larger canula inserted, says: "It is most prudent to abstain from interference. . . . I even recommend you to abstain from exploratory punctures, which there is a temptation to make with the view to elucidate the uncertainties of the diagnosis. These punctures may prove fatal if adhesions have not been formed between the tumour and the walls of the chest. . . . When circumstances peremptorily compel you to interfere so as to give exit to the fluids, the first indication is to excite adhesive inflammation, the existence of which is absolutely necessary. This, however, cannot be brought about unless the tumour is in contact with the thoracic walls, and unless there is no intervening portion of lung. This indication

will be fulfilled by making numerous acupuncture, and repeating them on several successive days. When adhesion has taken place, the pouch may be emptied by tapping it with a bistoury, or large trocar; after which it has to be injected with a solution of iodine."

M. Trousseau, however, concludes these remarks by stating that he has "never practised this method for the cure of hydatids of the lung," and does not know that it has ever been employed.

In France exploratory punctures appear to have been made in several cases for the purposes of diagnosis; but the systematic operative treatment of thoracic hydatid undoubtedly originated in, and is apparently still confined to, this colony.*

It was not till 1873, after many similar cases had been published in the *Australian Medical Journal*, over a period of ten or eleven years, that Dr. Dieulafoy, in his work on "Pneumatic Aspiration of Morbid Fluids," mentioned hydatid of the lung as a condition in which the needle might be introduced for the purpose of deciding a diagnosis. He mentions no such case, however, but one, in which he had already performed many tapplings in the liver. On October 3rd, 1871, in the Beaujon hospital, he no-

* On this subject Dr. Hearn (op. cit., p. 107) remarks:—"Bird pense que la ponction d'un kyste pulmonaire n'a jamais été pratiquée en Europe; en effet nous avons trouvé quelques observations de kystes de la plèvre traités par la ponction, mais nous n'avons point vu qu'on les ait dirigées contre les kystes du poulmon; ce sont les chirurgiens de Victoria qui ont vanté l'utilité et innocuité de ce mode de traitement."

ticed that "the dulness before observed on the right side, increased sensibly; there was diminution of the thoracic vibrations, without ægophony. There was no doubt that a fluid collection existed at this spot; but of what nature? A puncture was made with needle No. 2 in the sixth right intercostal space a little behind the axilla, and I drew off 800 grammes of a fluid as limpid as that which was drawn off from the first hepatic cyst. Had we to do with a cyst of the pleura, or of the upper surface of the liver?"* Pneumo-thorax, great dyspnœa, and incessant cough followed, with the expectoration of bloody and purulent mucus mixed with the *debris* of false membranes. The case ultimately made a complete recovery, and is evidently considered unique and extraordinary, though familiar as a household word to ourselves.†

* A Treatise on the Pneumatic Aspiration of Morbid Fluids, by Dr. Georges Dieulafoy, Gold Medallist of the Hospitals of Paris (*London*: Smith, Elder and Co., 1873), p. 79.

† It may here be interesting to European readers, and an act of justice to Victorian practitioners, to set at rest any doubts as to the priority of the cure of hydatids in the liver by immediately tapping with a fine trocar instead of "painful applications of caustic, followed by gaping wounds and injections of every kind," as described by Dieulafoy in 1873. On February 5th, 1861, Dr. R. F. Hudson, now of Ballarat, but then resident physician to the Melbourne Hospital, read a paper before the Medical Society of Victoria, which appeared in the April number of the *Australian Medical Journal* for the same year, on the subject of Hydatid. After calling attention to the rapid increase of this disease in the colony, and giving details of cases, and views of the etiology and pathology of the disease, he recounts the treatment in vogue in Europe by the injection of iodine, electricity, and caustics, and sums up his own views on the subject as follows:—"My own mode is tapping with a very fine trocar and canula $\frac{1}{64}$ inch in diameter, and the subsequent use of iodide of potassium. These have produced such beneficial results as perfectly satisfy me." I arrived in Melbourne from England myself the day before this paper was read, and on

The only treatments by operation that we propose to consider as appropriate to hydatid of the lung, are, immediate tapping with the fine trocar as soon as the diagnosis is determined on, while the cyst is still entire and undisturbed; and in exceptional cases of old standing, when there is a thick adventitious external wall to the cyst, which is generally closely adherent to the ribs, or in cysts of the pleura, free incision.

In tapping the lung, the trocar should be not less than six inches in length, and of the smallest diameter that is made, always providing that it is strong enough to bear the strain of a firm pressure. The point of the stylet must be very sharp, so as to pierce at once through any adhesion of the pleura, or a cyst unusually tough. The length of the instrument is an important item, as the cyst may be deeply seated, or

going round the Hospital with Dr. Motherwell, one of the honorary physicians, and Dr. Hudson, was shown several cases treated as above by these gentlemen, and shortly afterwards it appears to have been generally adopted by the profession in Victoria. Whether the operation was practised by others previous to Dr. Hudson's paper it is difficult to ascertain, but it is the first published mention of such a proceeding. By the way, the use of the aspirator does not seem to produce any better results in the liver than simple tapping; the sac often refills in either case, and if its contents degenerate a large trocar is required, and the peculiarities of this addition to the fine canula are rendered inoperative. I have heard of only two cases where fatal results followed tapping hydatid of the liver with the fine trocar. In one the stylet merely pricked the cyst, being too short to allow the canula to enter it, and fatal jaundice followed; in the other the evacuated fluid was tinged with bile (by no means an uncommon occurrence); no symptoms followed for twenty-four hours, when peritonitis came on and caused death in two days. Such results are exceedingly rare, probably not more than $\frac{1}{2}$ per cent. of cases operated on for the first time.

the chest wall thickly covered. The needles sold to be used with the aspirator by European instrument makers would not reach many cysts in the lung and liver which are tapped in this country. Having decided on the diagnosis, the portion of the cyst presumed nearest the surface should generally be selected, and this will in most cases be near its centre. A very small incision in the skin is advisable to save space and avoid any unnecessary strain on the long fine trocar, which should be fairly introduced with a firm and fearless hand till fluid is reached. Of course care must be taken to avoid the neighbourhood of the main vessels and bronchi, but, with this exception, I believe the length, strength, and sharpness of the instrument, if it be at the same time as fine as possible, is of more importance than the locality at which it is introduced. I have several times seen in my own practice and that of other Victorian medical men, exploratory punctures made in several localities with the view of reaching a supposed hydatid of the lung, the last of which only has reached it; excellent results have followed, and not even a local soreness has been felt at the site of the other wounds in the lung.

The question now arises as to the utility of the aspirator in these cases. They always do so well if tapped early enough with the simple trocar and canula, that the evidence in its favour is not very conclusive. I have seen it used on two occasions; both cases did well as usual, but recovery was not quicker than if the ordinary instrument without the

suction apparatus had been used. Theoretically, however, the more complete emptying of the cyst, and possibly its dislocation from its nidus, should aid in destroying the vitality of the parasite. If the cyst is tapped early, and has not been much irritated or interfered with till then, the limpid fluid will flow freely through the fine canula, and the expansion of the lung, which commences immediately the pressure of the fluid is removed, is generally sufficient to empty the sac, especially if aided by efforts at coughing, which indeed are generally involuntary.

Apart from this, and not now attempting to discuss the dynamics and hydrostatics of thoracic surgery affecting the aspirator (which after much trial I regard mostly in the light of an *ad captandum* quasi-scientific toy), it is not in pulmonary hydatid devoid of serious danger. The forcible disruption of the cyst from its bed by the suction power of this instrument has even in the skilled hands of Dr. M'Gillivray proved fatal. The cyst became impacted in a large bronchus, and immediate death resulted. In the old suppurating cysts, as we shall see presently, the aspirator is worse than useless, the parasite is only too willing to extrude itself, and does so immediately or within a few days after a free incision being made.

The cyst being successfully tapped and emptied, we must consider the best means of keeping it from re-filling. It has been proposed—(1.) To retain the canula or a piece of gum elastic catheter in the cyst.

Such a proceeding may be well enough in old cases, as we shall see presently, but is quite inappropriate to those we are now considering, as it adds a decidedly serious operation to a comparatively safe and harmless one. (2). To inject some irritating or parasiticide fluid, such as tincture of iodine, or kamela. To this the same objections apply. (3). To pass a galvanic current through the cyst, as has I believe been successfully done in some cases of hydatid of the liver. Of this, I must confess I have no experience, and my success by the means described has been so uniform that I have not yet been tempted to try it in an organ so nearly affecting the centres of vitality as the lung. A far safer, and in Victorian experience an almost uniformly successful treatment, is to employ internal remedies, the bromide or iodide of potassium and kamela, or turpentine, by the stomach or inhalation, and to tap again with the fine trocar if the cyst refills, but this will be exceptional. I have seen many cases—so many, indeed, that I have long ago ceased to take special notes of them—in which, in both liver and lung, a single tapping was sufficient, and the prolonged after-administration of these remedies completed a permanent cure. I have never had the opportunity of examining after death *in situ* a hydatid of the lung which had been tapped, but some years ago was present at the autopsy of a lady whom I had seen tapped by Mr. Fitzgerald for hydatid in the liver three years before, to the extent of four or

five pints of fluid. The above medical treatment was persevered in for some months, and the tumour never recurred; three years afterwards, however, she died of apoplexy. The sac was found far back in the right lobe of the liver, dense, leathery, and shrivelled, without a drop of fluid in it.

In the operation of tapping the unbroken cyst in the lung with the fine trocar, there are two circumstances that I have observed to occur, which may considerably embarrass a practitioner who is not much used to these cases. For example, being quite assured of the accuracy of one's diagnosis, the trocar is introduced to a requisite depth, but only a few drops, or perhaps an ounce or two of fluid flow from a cyst which you are convinced, from its outline, mapped on the surface, must hold a pint or two; the physical signs being meantime unaltered. The explanation of such failure is doubtless that the cyst has progressed to maturity quite unhindered, and is stuffed quite full of daughter-cysts. I am accustomed in such cases to re-introduce the stylet, and endeavour with its sharp point to stir up and break down the smaller cysts as much as possible. This is frequently followed by cough and rupture, and the death and expectoration of the parasite, but if not, a second operation should be performed within a few days, the internal remedies being given in the meantime. *Echinococcus* finding the hitherto even tenor of his way thus rudely and persistently interfered with, will, in most cases, give up the struggle for existence.

The other complication in the operation is sufficiently alarming, though rarely met with. This is the unavoidable piercing of a small bronchus by the stylet, in its passage through the condensed layer of lung-tissue. At first, all goes on as usual, and the fluid flows freely through the trocar; but as the pressure is removed, the bronchus becomes pervious, and violent paroxysmal cough comes on. I have seen only two such cases, one in the Alfred Hospital in the case of a servant girl, in whom I tapped a cyst of considerable size below the clavicle. Only about five ounces of fluid had flowed from the canula, when the cyst gave way into a bronchus, and violent cough came on, each expiratory effort being followed by a gush of hydatid fluid and portions of cyst. This went on for many hours, till the patient was very much exhausted, but the cough could not be stopped, for very obvious reasons.

The separation and expulsion of the whole parasite occupied many weeks; suppuration took place to an unusual extent, with complete anorexia and rapid wasting, the gangrenous odour of the sputa being with difficulty overcome by antiseptic inhalations. The case ultimately did well, and the girl came to show herself to me not long since, having got fat and strong. The breath-sounds are perfect all over the lung, a very remarkable fact which I have noticed in several of these cases, although from the great interference with the lung necessitated by the size of the cyst, a complete recovery could hardly be

predicted with probability.* The other case was a patient of Mr. Fitzgerald, a powerful, healthy man of about thirty-eight, in whom a large cyst of the left lung had been growing for some months. After consultation, he was tapped by that gentleman between the fourth and fifth ribs, midway between the folds of the axilla, that being about the centre of the cyst. After a few ounces of the usual clear fluid had flowed, most alarming symptoms came on, paroxysmal cough of a most violent character, with gushes of hydatid fluid from the mouth. The flow through the canula having ceased, it was removed. At each fit of coughing the man's countenance became livid, and the external veins about the throat and chest gorged. Meanwhile the affected side was distended and motionless, pneumo-thorax having evidently taken place. For three days the patient was unable to alter his position, half reclining on the affected side, the whole breathing being carried on by the other lung. The symptoms gradually subsided, the whole of the echinococcus was spit up, and the man sailed for England in about six weeks in excellent health. These accidents, though unavoidable, are

* The termination of this case is both curious and suggestive. Three years after the above was written I was called to a patient suffering from acute peritonitis, with symptoms of rapidly approaching death, whom I recognised as the above girl. She was at once taken to the Hospital, and a large mass of putrid cysts and foetid pus evacuated from the abdomen by large trocar, but she died of shock in a few hours. I shall never sufficiently regret that through inadvertence the condition of the lung, at the site of the old puncture, was not examined at the autopsy. The hydatid that caused death had originated in the folds of the omentum.

very rare ; these are the only two cases I have seen or heard of during my colonial experience, out of some eighty or ninety cases of operative interference with hydatid of the lung in my own practice and that of others*. I think an early operation would very much lessen the probability of such an occurrence as a pierced bronchus taking place, as the lung tissue before it has undergone much compression would, from its natural elasticity, resilience, and sponginess, be less open to such an accident, the more or less cartilaginous rings of the bronchus having lateral room to slide away from the point of the trocar.

We have hitherto been considering more particularly operative interference with the unbroken cyst, regarding which my own experience has been that the danger has been, not in tapping, but in delaying the operation until the lung tissue has become compressed and almost hepatised, and the whole relations of the parts within the thorax have accommodated themselves to the presence of a large foreign mass, and therefore will have all the more difficulty in returning to their normal relations. The question now arises, is it advisable to interfere when the natural rupture of the cyst has taken place, and the echinococci are being expectorated? As a rule, I

* Since the above was written, I have heard from Dr. Macmillan that a similar accident occurred to him when tapping a patient's lung in the Alfred Hospital. The case ultimately did well. Dr. Charles Smith, of Casterton, tells me that he has seen hæmorrhage occur while these cysts were being tapped. I have never noticed this myself at a first operation.

think not ; except the cyst is very large, very old, and in close proximity and probably adherent to the chest-wall, especially if the patient is becoming exhausted by the constant drain of pus and blood and the wearying cough. In such case the cyst should be treated as an abscess, and an opening of sufficient size made between the ribs to allow of the evacuation of its contents, when the constitutional symptoms will at once be relieved. I saw such a case with Dr. Motherwell seven years ago. The patient, a woman, was fast sinking from the fatigue and drain of constant expectoration of pus, blood, and fragments of putrid hydatid from an enormous sac in the right lung. There was every probability of close adhesions between the sac, pleura, and chest-wall. A full-sized trocar was introduced between the fourth and fifth ribs, and the opening enlarged laterally with a probe-pointed bistoury. Half a basinful of the contents of the sac was discharged in a few minutes, to the patient's great solace. Her appetite and strength returned, the hectic left her, and there seemed every probability of a favourable termination ; but with the contraction of the sac the canula slipped out, the wound closed, the discharge ceased, and the cough returned. The patient, dissuaded by foolish and ignorant friends, would not allow any further cutting operation, and she eventually sank from exhaustion. A free opening is necessary in such cases, as the quantities of cyst and dense and sometimes mortar-like masses cannot pass readily through a small one.

Mr. Fitzgerald had some years since a similar case in the Melbourne Hospital, in which the whole parasite was got rid of by a free incision between the ribs, and rapid recovery followed.

Since the above a group of such cases have come under my notice in Hospital and private practice, in which systematic endeavours to remove the whole parasite by incision have been successful, and complete recovery has followed. If the cyst has originated in the lung substance, as is most probable, its enlargement is gradual and from centre to periphery of thorax, and is nearly always more or less adherent to the chest-wall, and this is the secret of the almost uniform success of the following treatment of old suppurating cysts of the lung. If the cyst be in the pleura, the treatment is the same.

The centre of the sac, as nearly as can be judged, is fixed upon, as there the adhesion will be most close. This will probably be a little anterior to the angles of the ribs. An incision is made through the skin and muscles, and the largest-sized trocar and canula that will pass between the ribs is introduced into the sac. This gives exit to a quantity of pus and fragments of cyst of various sizes, and great relief follows. It is better to leave the canula in for some days or even weeks, and to wash the sac out frequently with some disinfecting solution. This delay is almost always necessary, to allow of the separation of the parent cyst from its nidus, and the gradual expansion of the lung. Immediate attempts at its removal by forceps are generally unsuccessful,

and portions are very apt to be left behind. At a convenient time the canula is withdrawn, and a sea-tangle tent introduced. The following day this is withdrawn and the wound forcibly dilated with the operator's little finger and probe-pointed bistoury, till a free opening is obtained which will lead directly into the cavity of the sac. Cysts of an older growth now gush forth, and after them the parent sac gradually extrudes itself entire or in pieces as the patient strains or coughs; seldom requiring much assistance in the way of traction. A piece of perforated elastic drainage tubing is now introduced into the cavity, and shortened every day or two as the lung expands. If the earlier part of the treatment has not been too hurried, recovery is generally rapid and complete after the cyst is removed. In old hepatic cysts which have refilled several times after tapping, and internal rupture is probable, I have several times employed the above treatment with equally good results.

Supposing a layer of still pervious lung intervenes between the cyst and chest wall, and the symptoms are of sufficient urgency to call for operative interference, what is to be done? Trousseau, as we have seen, recommends acupuncture, but has not used it. I think a better method is to pierce the lung to the sac with the fine trocar, and leave the canula in for a few days, when adhesions will probably form. Strange though it may seem, the large trocar will hardly reach the cyst in these cases, the spongy tissue of comparatively healthy

lung being by no means easily "penetrable stuff," and readily recedes before the point of the stylet when its diameter is much beyond needle size.

As a general rule, however, a few weeks' delay will find adhesions formed, and the case ripe for treatment by the method above described.

The first of these cases was J. C., male, æt. 38, admitted into the Alfred Hospital, under Dr. Bird, on June 28, 1874. The case at first sight presented the general appearance of one of enormous cyst of the liver; and, indeed, it turned out that the patient had been twice punctured in the hepatic region, with no result of fluid. Examination showed the fluid to be above the diaphragm, and that the liver was pushed down by it nearly to the pubes. A trocar introduced between the sixth and seventh ribs gave exit to 144 ounces of the usual clear fluid, with great relief. The sac soon refilled, and after a few days 84 ounces more of the same fluid were withdrawn. These two operations had evidently injured the vitality of the parasite, for on October 1st a third tapping gave exit to 70 ounces of fœtid pus. The canula was now left in the sac for three days, and then a drainage tube was inserted, the cavity being sedulously washed out with weak chloride of lime lotion. On October 29th, the case being now apparently ripe, I enlarged the wound laterally as described, and inserted a sponge tent. In removing this the following morning, Mr. Cooke, the House-Surgeon, found, as I had hoped, the cyst presenting, and

with most commendable care and patience succeeded in about an hour and a-half (by successively twisting each portion into a rope, as it was extruded, so as to ensure its coherence and tenacity) in extracting the whole entire and unbroken, except at the original opening. The specimen is now before me, and weighs close on one pound. To allow for its evident size, a larger incision than usual had been made. After this, the lung gradually expanded, until 14th April, 1875, when a shallow fistulous track only remained, with breath sound audible all round to its immediate margin. The patient was about to be discharged, cured, when most unfortunately he contracted erysipelas, which was at that time prevalent, and died on 20th April. Post-mortem showed the hydatid to be radically extirpated, no trace of it remaining. The lung had completely expanded all round a dense pleural adhesion, through which the incision had passed. Of this a shallow fistulous track only an inch and a half deep remained. The rest of the lungs showed diffused suppuration with scattered local abscess, the cause of death being septicæmia from erysipelas, in no way connected with the original hydatid disease.

CASE II.—J. S., female, æt. 22, admitted 18th October, 1874, under Dr. Barrett, with the usual symptoms of hydatid cyst in the left lung. She was tapped, and clear fluid withdrawn on the 19th and 27th inst. On the 14th November fifty ounces of very foetid pus drawn off by large trocar and canula.

On 30th November a free incision was made, and the whole parent cyst came away. Discharged, cured, 29th December, 1874.

CASE III.—M. B., female, æt. 33, admitted 20th October, 1874, under Dr. Barrett. In this case bulging of the chest on the right side was very marked. She had been twice tapped by Dr. Blair before admission, and a full report of the case by that gentleman appears in the *Australian Medical Journal* for April, 1875. The parent cyst was extracted in the manner described, and the patient was discharged, cured, on 20th December, 1874.

CASE IV.—E. M. L., female, æt. 21, admitted 30th October, 1874, under Dr. Bird. I visited this patient at her home with Dr. Ralph, whose patient she was, and found her condition so alarming from the enormous size and pressure of a cyst in the right lung, that her removal to the hospital without partial relief was impossible. Dyspnœa was very urgent, the skin dusky, and syncope occurred on the slightest movement. Rupture of the cyst was evidently imminent. A moderate sized trocar was introduced between seventh and eighth ribs, and about 20 ozs. of non-fœtid pus removed. This relieved the immediate symptoms, and the girl was carried as she lay on her mattress in a furniture van to the hospital, and a larger canula at once introduced. Not many ounces of pus and small cysts had escaped, before violent paroxysmal cough came on, and the canula had to be removed before the

cyst had emptied itself. Rupture into a bronchus now evidently took place, as foetid pus and cysts continued to be spat up, and the patient's strength was failing; a large-sized canula was inserted between sixth and seventh ribs, two inches behind the previous punctures. Through this, the whole parasite, whose walls were very thin and fragile, came away. The usual after-treatment was followed out, and the patient was discharged, cured, on April 10th.

CASE V.—M. H., female, æt. 21, admitted under Dr. Bird, October 30, 1874, with a large suppurating hydatid cyst of the right lung, treated in the usual way. The parasite came away piecemeal, and the patient was discharged, cured, on 4th February, 1875.

CASE VI.—A. E. R., female, æt. 11, admitted 3rd December, 1874, under Dr. Barrett, with suppurating hydatid of left lung. Treated as usual, and discharged, cured, on 3rd February, 1875. Cyst came away piecemeal.

CASE VII.—C. O'D., male, æt. 12, admitted 23rd May, 1875, under Dr. Bird, with suppurating hydatid of right lung. Treated as usual, and discharged, cured, 1st August, 1875. Cyst came away piecemeal.

CASE VIII.—C. F., female, æt. 30, under the care of Dr. Bird (private practice); a large unbroken hydatid of the base of the right lung. In this case bulging of the chest was very marked, the cyst having developed to a large size undisturbed. Tapped between eighth and ninth ribs, on 11th April, 1876. Liver much pushed down. The para-

site came away piecemeal. In this case there was rather alarming arterial bleeding through the canula some days after the first tapping, necessitating the use of perchloride of iron injections. Left for her home in the country, cured, on 25th June, 1876.

CASE IX.—The following case is so interesting and unusual that it deserves to be recorded in detail. A gentleman, *æt.* 22, consulted my friend, Dr. Charles Smith, in the Western District, with the usual symptoms of a large hydatid cyst in the middle lobe of the left lung, on January 3, 1875. He had suffered from cough and wasting for several months. Internal remedies were tried, but the cyst gradually enlarged in size; and on the night of February 18th, after exerting himself in fencing during the previous afternoon, it burst into the pleura. The unfortunate young man lay for many hours unable to move or make any body hear, and when found in the morning was nearly dead. Dr. Smith was sent for, but as he lived 50 miles off, it was some hours before he could arrive. He found the patient livid, cold, and sweating profusely, in great distress and almost pulseless. "The heart was pushed over to the right side, the lung compressed into the upper corner, and a distinct opening from the lung into the pleura. By placing him on the left side (writes Dr. Smith), so as to give the right lung free action, he got better." Severe urticaria, which did not disappear for several days, covered the whole body. He improved slightly after this, and on February 15th Dr. Smith tapped him and removed

about 12 ounces of the ordinary clear fluid. This relieved the breathing, and the heart partly returned to its normal site. In a few minutes, however, the air began to pass into the pleura again, and the old condition of things was restored. Under these circumstances Dr. Smith advised him to go to Melbourne and place himself under my care, with a view to the removal of the cyst. On August 27th I examined the patient in consultation with Dr. Motherwell. His condition was as follows:—Emaciation very marked, pulse 130, able only to lie on the left side in a diagonal semirecumbent posture. Afternoon hectic and night sweats, tongue loaded, appetite almost nil. Cough constant, with expectoration of fœtid pus, which often comes up in gushes, with shreds of putrid cyst. Dyspnœa always urgent, but during a strong coughing fit alarmingly so, as the pleura becomes distended with air. Heart to the right of the sternum. On ausculting the chest a medley of sounds was heard, comprising cavernous breathing, metallic tinkling, gurgling and a peculiar whistling sound as the air passed into the pleura, which evidently contained fluid and a mass of cysts. The percussion of course varied with the degree of pneumo-thorax. While examining the patient in a sitting position a fit of coughing came on, the left side was suddenly distended with air, and most alarming dyspnœa followed. Without loss of time, I at once incised between the fifth and sixth ribs, and rapidly introduced a large trocar and canula,

through which a gush of fœtid gas, pus and fragments of cyst were at once expelled with great force, and immediate relief. As soon as the patient's condition would allow of it, I enlarged the opening in the usual way, and removed a large tough mother-cyst broken into two or three fragments. From this time rapid improvement went on; the pleura was sedulously washed out twice a day with weak Condyl's fluid and water; the broncho-pleural fistula closed, the heart returned to its natural position, and cough and expectoration ceased. The wound was allowed to heal in the last week in November, and on December 14th the patient returned to his home in the country in excellent health, and weighing 11st. 6lbs.

The cure was, however, not destined to be permanent, for on 8th June, 1876, the patient came to me again in a condition but little less alarming than before. It turned out, that relying on his restored health, he had over-exerted himself at cricket, riding, and other violent exercises, and after exposure to wet and cold, had got a recurrence of chest symptoms. On examination the state of things was easily recognised. Low inflammatory action had set up in the nidus of the old hydatid cyst of the lung, a portion of which still remained there at the time of rupture into the pleura, and a collection of matter had formed. The broncho-pleural fistula had also re-opened, but evidently to a much smaller extent than before. I introduced a trocar and canula through the old cicatrix into the abscess, and for

many weeks retained it there, washing out daily foetid pus, with occasional fragments of cyst. During this time, the curious discovery was made of a calcareous mass imbedded in the substance of the lung, which is evidently the remains of an old hydatid, which had undergone spontaneous death and degeneration years before, probably dating from an illness which the patient suffered as a boy, attended with cough and hæmoptysis.

At different times during the treatment of the last phase of the case three new hydatids have made their appearance on the side and front of the left chest in the cellular tissue of the intercostal spaces. They were disposed of by tapping and injection with iodine. The patient has now very fair health, with but slight morning cough and expectoration, and is gaining flesh and strength. About two or three drachms of clear odourless serum, exude through a small piece of catheter which he wears in the wound, in the twenty-four hours. The heart's position is nearly normal, but the left chest is much contracted and the breath sounds feeble and distant, except at the apex of the lung. An attempt was made a few weeks ago to close the long fistulous track in the lung, which reaches back nearly to the spine, by destroying the pyogenic membrane by the galvanic cautery with a loop of platinum wire, but without success. The right lung, which at one time seriously threatened tubercular mischief, is healthy.

I saw an instance last month showing the importance of not delaying operation in these cases. It

was an enormous cyst in the right lung of a middle-aged man, on whom I had arranged to operate at once. The friends, however, interfered, and would allow nothing to be done. The cyst burst the following week, and death resulted in two days. A small trocar introduced by a neighbouring surgeon, who was called in, gave no relief. In all probability this case would have done well if treated by the method I have described.

We now come to the medical treatment, which must be regarded more as an aid or adjunct to operative treatment than as likely to do good independently. There has been much scepticism indeed, both here and in Europe, concerning the power of any agent given by the stomach to influence the vitality of these parasites. Experience, however, shows that the bromide or iodide of potassium, combined with kamela, given continuously for several weeks, has a distinctly sickening and irritating effect on the acephalocyst, although it is obvious that a remedy that must work through the blood to influence an entozoon embedded in the solid viscera, cannot have nearly so rapid an effect as it would in a case of tape-worm, for example, where the animal is lying exposed and bare in the intestinal canal. Recent observations, however, have led me to believe that these remedies have more influence than I had formerly been disposed to think. The following cases furnish examples :—An elderly man had been tapped twice or thrice by another practitioner for hydatid of the liver, but without a permanent cure resulting.

He came to me with the cyst very palpably refilled, apparently to the extent of 30 to 40 ounces, but declined to have any further operation performed. I prescribed 20 gr. of bromide of potassium, with 1 fl. dr. of tincture of kamela (4 oz. to 20 oz. of rectified spirit) in infusion of serpentary, three times a day regularly. Under this the tumour gradually subsided, and in six weeks was not perceptible. Nearly five years have now passed, and the patient has suffered from other disorders, but the hydatid has never recurred.

The other case was that of a girl, fourteen years of age, who had a hydatid of the liver of great size and probably very tough and thick-walled, for the point of the stylet being a little blunted, failed to pierce it, and a dry tapping was the result, as the patient refused another trial. The bromide and kamela were administered sedulously for some months with occasional intervals, until the tumour completely disappeared. The trifling injury to the acephalocyst by being pushed before the stylet could hardly of itself account for the cure; it is more probable that the drugs, though possessing but little influence over the untouched and healthy parasite, do seriously disorder its nutrition when at all enfeebled by interference. I allow, of course, the possibility and occasional occurrence of spontaneous death of an acephalocyst, without rupture or operation; but this is excessively rare, and the mass of experimental evidence, the only test of truth in estimating the

value of the effects of drugs on the diseased human subject, weightily bears down the scale in favour of the above proposition. It might be worth while to atomise weak solutions of kamela or santonine, and cause the patient to inhale them. They would pass into the blood more directly than when given by the stomach, and in early cases there might be a possibility of endosmosis through the walls of the sac.

Turpentine, from its well-known anthelmintic powers and ready diffusibility, has naturally suggested itself as a remedy, both by the mouth and by inhalation. I have seen some cases where marked benefit has followed its administration, and others when it has signally failed to influence the vitality of the parasite. It should, however, always have a trial.*

As we have seen, the risk of operative interference with hydatid cysts in the thoracic and abdominal viscera may be reduced to a minimum, by the early use of the fine trocar, but the question naturally arises, What are the risks of non-interference? These may be remote or immediate; the former we have already alluded to as arising from the results of prolonged pressure on the lung substance, and its blood-vessels and bronchi. If the cyst bursts of itself, a tedious, exhausting, and dangerous process of expul-

* The late Dr. T. Warburton Begbie, in his address on Medicine before the British Medical Association, at Edinburgh, in 1875, while noticing my writings on this subject, gives me the credit of originating the use of turpentine in pulmonary hydatid. To this I lay no claim, as it first suggested itself to me from reading a report of a case of undoubted cerebral hydatid, which rapidly recovered under its use, published by Dr. Elmes, of this colony.

sion has to take place, attended with severe constitutional symptoms, from which probably not more than 30 or 40 per cent. of cases recover. But besides this, there is a risk of sudden death from the bursting of a large cyst in the lung, of which the following case is a good example:—A large-framed and powerful man of middle age and sanguine temperament consulted Mr. Fitzgerald and myself for a hydatid cyst of the lower lobe of the right lung. The general symptoms were principally hæmoptysis, gradually increasing dyspnœa and cough, but the general health was good. Tapping was urgently advised, as the hydatid was of large size, and the lung a good deal compressed; he consented, but at the last moment, when the trocar was about to be introduced, his courage failed him, and he refused to have anything done. About a month after this he was sitting on the back seat of a car, which was being driven over a rough bush-road. A sudden jolt threw him off, and he fell on his side, but was not hurt, for, as appeared in evidence at the inquest, he jumped up at once, saying that there were “no bones broken.” A few seconds afterwards, however, paroxysmal cough came on, with gushes of frothy fluid from the mouth and nose. He turned black in the face, and died in a few minutes of asphyxia. The cyst had, doubtless, been burst by the fall, and the man was suffocated by its wall and contents plugging the air passages. No *post mortem* was made, as the cause of death was obvious.*

The question of prognosis in hydatid of the lung is one which the practitioner is often called upon to answer. As we have seen, an early diagnosis and tapping with the fine trocar, with persistent appropriate drug medication, render the death of the individual parasite almost a certainty, and this being accomplished, of course the danger is done with as far as it is concerned. But we have yet the possibility of other hydatids making their appearance on the lung or in other organs. Every-day experience shows us, with regard to intestinal worms and other entozoa, and indeed parasitic animals in general, that some persons are particularly susceptible to the invasion of such creatures, or rather I should say to their development after entrance into the body. Weakness or strength of constitution seems to have little to do with it, but rather idiosyncrasy. Some persons cannot drink a single glass of unboiled water in a district where tapeworm is endemic without shortly afterwards finding the symptoms of a lodger in their inside, while blood-relations, offering no contrast in visible physical development, never suffer. Some cannot come within speaking distance of a flea or a pediculus without their insisting on cultivating the

* A well-known publican of this city died a few years ago under similar circumstances, in consequence of his refusal to have an enormous hydatid of the liver tapped. The cyst was burst by a trifling fall against the counter of his bar, and he died in a few hours of peritonitis. A young woman was found last year, in Fitzroy, moribund in her bed, having retired in good health, though her friends had remarked that she was "getting rather stout." The autopsy revealed a hepatic cyst, which had burst into the cavity of the abdomen.

acquaintance to the extent of intimacy, while the peculiarities of others seem to repel these unwelcome guests. An individual who has once had hydatid, thereby proves his title to susceptibility to such disease, and has therefore *cæteris paribus*, more chances of again contracting it than his neighbour, whose person is still in a virgin state, echinococcically speaking, though, of course, many persons do escape with only one attack. For example, a young lady, one of a family of five, was brought to me five years ago, with a hydatid of the liver of considerable size. Tapping, and the bromide and kamela, cured it as usual, but though great care with regard to the drinking water was taken, another cyst developed in the upper lobe of the right lung about a year afterwards. This also was tapped, and the same drugs given, with the result of a complete cure, no trace of either parasite being appreciable at the present time, and the young lady being in excellent health. None of the other members of the family have ever had any symptoms of the kind, nor any of the numerous servants on the estate. Such susceptible persons can but avoid drinking any water but what has been boiled or stone-filtered, the former being by far the safest; and if, in spite of this, they contract hydatid, it is their misfortune, not their fault. Then, being fore-armed as well as fore-warned, they should attack their enemy, both from without and within, with cold steel and poison while he is still in his tender youth, and nip the young colonist in the bud, before he has had time to

frame his new constitution, and build a wall round his rising township. No Fabian policy will succeed with a hydatid, he must be crushed as soon as he is discovered, as emperors crush revolutions, and boards of health stamp out small-pox.

The question of probability of recurrence of hydatid is one of special importance in reference to the selection of lives for assurance by Australian companies. Should an applicant be declined because he has formerly had hydatid of an internal organ? Not absolutely, but he certainly requires considerable "loading" to bring him to the level of others, who have been unaffected; he has, as we have seen, proved his susceptibility, and should the disease reappear, no human foresight can predict that it will not be in the brain or heart, where it is probably fatal. A striking instance of the importance of a guarded prognosis occurred in my own experience in this city. An otherwise healthy man suffered greatly from hydatid of the lung, during whose expectoration he was reduced to death's door, and acquired a well developed phthisical appearance; he had been tapped in several parts of the chest. Eventually he got quite well, and for the last three or four years I noticed him about town fat and ruddy, and evidently in excellent health. One day I saw his death in the paper, and on inquiry of his medical attendant, found that though never having left Melbourne, he had been attacked with a simultaneous development of hydatid in several internal organs, and at last apparently in the heart, as

he died suddenly. As a balance weight to this, I remember declining a well-known merchant in Melbourne, about twelve years ago, for life assurance, on account of a former attack of hydatid of the lung, attended with hæmoptysis, but he is still in good health, and has had no return of the disease.

It is difficult to ascertain with any certainty to whom the credit of immediate tapping of cysts in the lung is due. The first recorded case I have been able to find is in Mr. MacGillivray's paper in the *Australian Medical Journal* for August, 1865, where it appears that Mr. Cheyne, one of the surgeons to the Bendigo Hospital, on May 23rd of the same year, punctured a large cyst between the third and fourth ribs with an exploring trocar. The operation was, however, done on several occasions in Melbourne previous to this date by several local surgeons and by myself. The feasibility of such a proceeding was, no doubt, suggested by the harmlessness of tapping the liver, and proved by cases which were tapped for pleuritic effusion, the fluid turning out to be hydatid.

It is a matter of considerable regret to me, that I have not kept notes of all the cases of hydatid of the lung that have come under my notice in this colony. The very frequency of the disorder has led to this (I have at this time no less than eleven cases under my notice in private practice), as well as the nearly constant recovery when tapping was resorted to. See Appendix C.



APPENDIX A.

LETTER FROM DR. RALPH, PRESIDENT OF THE MICROSCOPICAL
SOCIETY OF VICTORIA.

Kew, *March, 1877.*

MY DEAR SIR,

As we are both interested in the subject of hydatid disease, I take this opportunity which you have afforded me of stating my views, which I have held for some years past, with regard to its natural history.

After many years of struggle, the profession has come to recognise the fact that hydatid cysts are of parasitic origin; and this discovery is now fully admitted, and taught in the medical schools.

But I consider we have here an incomplete history of the disease, for I maintain there are reasons for suspecting that all hydatid cysts are not due to *one* form of parasite (*i.e.*, *toenia*, or tapeworm), and therefore we may look out for some other agents, which may give rise to modifications in these cysts.

This additional element I regard to be fluke, acting under the same laws as followed by the organisms of *toenia* in evolving the ordinary hydatid cyst, but, when originating from the fluke, giving rise to a less distinct form of cyst, and which will be found to contain less fluid and exhibiting caseous forms—such conditions being chiefly met with in *post-mortem* cases.

I trust the "*Cui bono*" exclamation about all this is dying out, and instead of placing this ready obstacle of our ignorance before us, we are preparing to carry out further inquiries in determining fully the history of this disease. Indeed, it is beginning to be quite needful that we should be able to diagnose this disease in the lungs after it has been established some time, having passed from the condition of the first stage of rupture, in which the discharge of hooklets (as in *taenia hydatid*) lasts only a few days, to the second stage, in which we may have persistent cough and expectoration without the presence of hooklets, but the sputum presenting the minuter and less known elements composing the hydatid cyst. These last being unknown or disregarded, the disease at this stage cannot be readily and clearly diagnosed.

Again, suppose we have a case of hydatid disease in the lungs, originating, not from *taenia*, but from fluke, as I have suggested, the discharged sputa will, of course, contain no hooklets to inform us as to the real state of the case, seeing these organs (hooklets) are absent in the fluke. But if we are familiar with the organisms of this parasite, we shall be able to state it to be a case of hydatid disease, even if we cannot determine it to be derived from *taenia* or fluke invasion.

As the matter now stands with the profession, the presence of hooklets in the sputum is the only accepted evidence of hydatid disease. Possibly an echinococcus without hooklets might be recognised as affording sufficient evidence. But I maintain we have more elements to guide us here, and with which we need to become familiar.

Firstly, we have hooklets.

Secondly, echinococci, or the elementary heads of the *taenia*, with or without hooklets.

Thirdly, there is the laminated membrane of the cyst, minute fragments of which can be detected by the microscope.

Fourthly, we may have the cells contained in the echinococcus, consisting of round and oval shining bodies, which, if carefully watched during some days, increase in size and furnish two forms of cells: one in which the cell wall is very delicate, and another

in which, owing to more imbibition of nutrient matter, the walls are much thicker.

Besides which we may encounter granular matter, which at present we cannot distinctly affirm as coming from a hydatid cyst.

In addition to these elements, I have noticed two others—1st, a living acarus taken out of the fluid of a hydatid cyst tapped in my presence; and, 2nd, a distinct organised worm of minute size from a *post-mortem* specimen of hydatid disease.

With regard to the acarus, which was observed by me ten years ago, I know great difficulty will present itself to many minds; but let me here adduce the independent evidence of an observer who records his observation of the presence of acari on the pleural surface of the lung of a bird, there being no communication with the external air. This is described, with a plate, in the *Microscopical Journal*.

And, lastly, I have met with minute ova-like bodies covered with minute bristles or hair-like appendages (from a hydatid cyst), which I consider may be ova of acarus.

All these objects having been noticed in hydatid fluids or cysts, we may encounter them without recognition in the sputa of patients. As far as my present observations have gone, I consider that in a late case of yours I recognised granular matter and minute layers of membrane and cell-like bodies of very delicate structure in the sputum, all these objects being easily noted in hydatid cysts.

But there yet remains another point to consider. I maintain, from some observations, that the minuter forms of organisms in large hydatid cysts can be absorbed into the circulation by rupture of the *laminated* cyst wall from direct violence; thus giving rise to sudden and extensive congestion of the lungs in the human subject; and I suggest that in suspected cases of this kind a careful examination of a small quantity of blood would reveal to us the presence of foreign matters, and convey to us a more just knowledge of the cause of the attack. And let me add a truism in which all are interested, that a more correct diagnosis of a

disease is a stepping-stone to a more successful treatment of the case.

I can call to mind now a case, the history of which I could not learn, but in which the sputum greatly puzzled me by exhibiting minute cells resembling those seen in your patient's expectoration, and which I now consider to have been due to the slow disintegration of minute hydatid cysts, extending over several months. The case is now recovered. I have noticed minute cysts in a liver not larger than this O.

I remain, yours faithfully,

THOMAS SHEARMAN RALPH.

DR. D. BIRD.

APPENDIX B.

“AGAINST the aspirator as an adjunct to the trocar and canula in thoracic surgery, I have a prejudice, which I firmly believe to be well founded. I have several times used it and seen it used, but never could find that it was any improvement on the simpler method of trusting to natural atmospheric pressure, when a vent is given to foreign fluid in the viscera. Theoretically, it is utterly opposed to what we know of both the statics and dynamics of the chest-cavity and its walls; practically, I have seen it positively mischievous, by forcible and sudden traction, at points which should only be acted upon gently and gradually, and by causing hæmorrhage, by removing atmospheric pressure from exposed blood-vessels in the walls of cavities. Lastly, it is vicious in principle to the scientific practitioner, as it brings a force of unknown relative power to bear on parts which are out of his sight, and of whose condition he cannot be absolutely cognisant.”—From a paper by the author in the *Australian Medical Journal*, September, 1875, entitled “The Trocar in Thoracic Surgery.”

I may mention that for the last fifteen years I have been in the habit of immediate tapping with a fine trocar in cases of pleurisy with effusion, and am convinced that this shortens the duration of the case by one half, reduces the chance of purulent degeneration to a minimum, and of course saves the lung from the consequences

of pressure, and the system from the tedious process of absorption. I never saw any but the best effects follow this procedure. Considering the immediate relief it gives, and the facility with which it is done, it is strange that this operation is not recognised in the text-books. Even in cases of limited effusion to the extent of only a few ounces, I often tap at once, and find that the duration of the case is shortened from weeks to days, a matter of great moment to business men. In such cases the aspirator is nothing else than vicious, and no complicated valvular apparatus, *a la* Bowditch, is required; all that is necessary is a foot or two of elastic tubing slipped over the head of the canula after introduction, the distal end of which dips into a vessel containing a little water. If the patient lies quietly on his side, as the pleura gradually empties with the dilatation of the lung—a process which should occupy from one to two hours at least—the entrance of air is impossible, and no risk is incurred, as is always the case with the violent and unnatural suction power of the aspirator.

APPENDIX C.

THE eleven cases referred to are as follow :—

I.—Male, *æt.* 45, commercial traveller, generally resident in Melbourne; left lung.

II.—Female, *æt.* 24, wife of railway porter, till the last three years in a mining township; left lung.

III.—Male, merchant, *æt.* 32, resident in Melbourne for the last five years, in England previously; right lung.

IV.—Male, squatter, *æt.* 24; left lung. Always resident in Western District.

V.—Male, commercial traveller, *æt.* 45, principally in Melbourne; right lung.

VI.—Female, *æt.* 15, always in Melbourne; left lung.

VII.—Male, *æt.* 27, mechanic, always in Melbourne; right lung.

VIII.—Male, *æt.* 50, farmer, resident for many years ten miles south of Melbourne; right lung.

IX.—Male, shopkeeper, resident in Melbourne for many years; right lung.

X.—Female, *æt.* 70, many years in Melbourne; expectorated a large cyst from right lung a few months ago; has now pleuritic pains near its former site.

XI.—Male, miller, resident for some years in a fluky district in New South Wales; cysts in both lungs and liver.

Cases II., IV., VI., and VIII. were tapped and are doing well. The others are recovering by the expectoration of the parasite, more or less rapidly. Of these No. I. coughed up apparently the whole mother cyst last week, to his great relief, though he nearly choked in doing so.

No. IX. strongly resembled a case of chronic phthisis, the cyst being in the right upper lobe. He is now quite recovered.

In No. V. there was coincident hydatid of the liver.

All these cases have been or are taking the parasiticide drugs before mentioned.

Case XI. will be tapped shortly.

It will be noticed that residents in Melbourne have rather the majority in this list, which may be taken as a good general average of this class of cases.

OPINIONS OF THE MELBOURNE PRESS

ON THE FIRST EDITION.

The ARGUS, May 18th, 1874.

DR. BIRD, who is known to have paid special attention to lung diseases, has in the little work before us laid down with much brevity and succinctness rules for the systematic physical diagnosis of hydatids of the lung, and their cure by operation and the use of medicines. It is rare indeed that a writer on medical subjects can with justice lay claim to the credit of opening up entirely new ground, as has been done in this instance, and we may congratulate the medical profession of this colony on the fact that one of their number, well qualified for the task, has produced a work which though brief and unpretending in its appearance, ably vindicates its priority and originality in the diagnosis and treatment of these diseases. In these days of plagiarism and diffuseness it is quite refreshing to meet with an author who has not only something new to write about, but who is content to write it plainly and concisely. Dr. Bird's little monograph cannot fail to take its position as the standard authority on the subject of which it treats, both from its actual merits, and the author's special reputation in the study of pulmonary complaints.

The AGE, May 23rd, 1874.

THIS work is stated to be the result of thirteen years' practice in the colony, and is the *resumé* of two papers read before the Medical Society of Victoria, and published in the *Australian Medical Journal*. Dr. Bird enjoys so high a reputation for skill in all matters connected with pulmonary disease that any contributions from his pen upon that subject will be read with interest.

The DAILY TELEGRAPH, May 19th, 1874.

DR. BIRD has made diseases of the lung his special study, and we have the fruits of a peculiar portion of his experience in the work before us. Hydatids of the lungs are almost peculiar to Australia. At least thirty cases will occur here to one in England, and the consequence is that the disease is classed among those described as "obscure." The profession everywhere will

probably now recognise the needle as the legitimate treatment for the disease, and Dr. Bird has therefore to be congratulated upon his labours and their successful result.

The AUSTRALASIAN, May 23rd, 1874.

LIKELY to be a welcome addition to the library of every Victorian practitioner.

The AUSTRALIAN MEDICAL JOURNAL for April, 1874.

DR. BIRD has published, with some additions, the substance of two papers read before the Medical Society, on the above subject. It is but a *brochure*, but it has the especial recommendation of being the only work on Hydatids, in which the rules for diagnosing this disease in its early stages in the lung are clearly laid down. It requires no great skill to say that there are hydatids in the lung when a patient is coughing up the cysts of this parasite, but quite another kind of discernment is necessary when it is demanded that this lesion shall be differentiated from other chest affections. And it was precisely this knowledge which was required to be formulated, and to Dr. Bird is due the merit of being the first to do so. He had an unusual experience in dealing with the disease, and his opportunities, therefore, of observing all the symptoms characteristic of it, have been such as to give him a particular right to treat upon it. He has defined in clear and unmistakable language the conditions which may warrant us in pronouncing upon the existence of this affection in the lung, more particularly those which serve as a guide in preventing our confounding hydatids with other morbid conditions of this organ.

To those in England who, from lack of experience, may hesitate before using the trocar in this disease, Dr. Bird's numerous successful cases may offer an assurance of safety that will help greatly to modify the treatment hitherto pursued. It is clear from what he says, that tapping is by far the most effective mode of controlling it, and the more limited experience of others is amply confirmatory of Dr. Bird's conclusions. From this time, both the treatment and diagnosis of lung-hydatids, may be considered to be settled, and Dr. Bird's little work, besides adding to his own well-established reputation, will help not a little to show to our brother practitioners in the Old Country, that in the important work of pathological investigation, we are able not only to keep an even pace with what is being done there, but to go a little beyond them, so as to offer, as the outcome of a more extended opportunity of observing the disease, rules for guidance both in recognising and in treating it.